

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1-13 and 24 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejections in view of the Amendments and Remarks as set forth hereinbelow.

CLAIM FOR PRIORITY

It is gratefully acknowledged that the Examiner has recognized the Applicants' claim for foreign priority. Because the Applicants' claim for foreign priority has been perfected, no additional action is required from the Applicants at this time.

DRAWINGS

It is gratefully acknowledged that the Examiner has approved the Formal Drawings submitted by the Applicants. The drawings comply with the requirements of the USPTO. No further action is necessary.

ACKNOWLEDGEMENT OF INFORMATION DISCLOSURE STATEMENT

The Examiner has acknowledged the Information Disclosure Statement filed on August 15, 2004. An initialed copy of the PTO-1449 has been received from the Examiner. No further action is necessary at this time.

REJECTION UNDER 35 USC § 112

Regarding the rejection of claims 1-23 under 35 U.S.C. § 112, second paragraph, the Office Action indicates it is not clear whether the heat treatment steps being applied to the adhesive are towards a method of making the fiber optic inspection device which results in a strain and that this would not further limit the inspection method itself.

It is respectfully noted the compressive strain is caused in the sensor part by hardening the thermo-setting adhesive at a temperature higher than room temperature and then retuning it to room temperature. Further, it is respectfully submitted this feature does further limit the inspection method itself, because the sensor part is embedded in the adhesive and thus a compressive strain is caused in the sensor part using the claimed thermo-setting adhesive which is hardened at a temperature higher than room temperature and then returned to room temperature. If the sensor part was imbedded into the adhesive after the heating process, the claimed compressive strain would not be caused in the sensor part.

Therefore, it is respectfully requested the rejection of claims 1-23 under 35 U.S.C. § 112, second paragraph, be withdrawn.

REJECTION UNDER 35 U.S.C. § 103

Claims 1, 3-17 and 20-23 were rejected under 35 U.S.C. § 103(a) as unpatentable over Ball in view of Applicants' Admitted Prior Art (AAPA), and claims 2, 18 and 19 were rejected under 35 U.S.C. § 103(a) as unpatentable over Ball in view of AAPA and Chen et al. These rejections are respectfully traversed.

Independent claim 1 includes a combination of features and is directed to a bond separation inspection method including joining together two members with an adhesive, embedding a sensor part of an optical fiber sensor in the adhesive, introducing a light from a light source into one end of the optical fiber sensor and causing light from the sensor part to emerge from another end of the optical fiber sensor, and detecting separation of the bond of the two members on the basis of an optical characteristic of the light from the sensor part. Further, embedding the sensor part in the adhesive includes causing a compressive thermal compressive thermal strain to arise in the sensor part, due to different thermal expansivities of the adhesive and the

sensor part so a refractive index period of the sensor part is sufficiently reduced such that a wavelength of reflected light emerging from the another end of the optical fiber caused by a bond separation is separated from a wavelength of reflected light caused inherently by the sensor part.

These features are supported at least by Figures 4-7, for example. In particular, Figure 6 illustrates causing a compressive thermal strain to arise in the sensor part due to different thermal expansivities of the adhesive and the sensor part so a refractive index period of the sensor part is sufficiently reduced such that a wavelength of reflected light emerging from the another end of the optical fiber caused by a bond separation is separated from a wavelength of reflected light caused inherently by the sensor part. Figure 7 illustrates the peak P2 corresponding to reflected light emerging from the another end of the optical fiber caused by a bond separation.

On the contrary, Ball is discussed in the Background of the Invention of the present application at paragraph [0005] and is directed to applying a test load to material joined with an adhesive and recording a characteristic of load displacement between the joined materials by comparing the applied load with a reference load. As noted at paragraph [0008] of the present application, the method in Ball requires that a load be applied.

Further, Chen et al. merely indicates that high residual compressive strains can occur when the specimens are allowed to cool after the adhesive is cured at elevated temperatures (see column 7, lines 65 - column 8, line 6). In this section, Chen et al. teaches away from using compression strains. Further, Chen et al. does not teach or suggest creating a compressive thermal strain so a refractive index period of the sensor part is sufficiently reduced such that a wavelength of reflected light emerging from the other end of the optical fiber caused by a bond separation is separated from a wavelength of reflected light caused inherently by the sensor part as in the present invention.

According, it is respectfully submitted independent claim 1 and each of the claims depending therefrom are allowable.

Further, independent claim 10 has been amended to be a dependent claim and corresponds with the feature shown in Figure 14, for example. It is respectfully noted the applied art does not teach or suggest the combination of using both the compressive thermal strain and applying a predetermined load as dependent claim 11. Accordingly, it is respectfully submitted dependent claim 11 further defines over the applied art.

NEW CLAIMS

In addition, new claim 24 has been added to set forth the invention in a varying scope, and Applicants submit the new claim is supported by the originally filed specification. In particular, new dependent claim 24 recites that the refractive index period is reduced at least by 50%. It is respectfully submitted this feature is supported at least by Figure 6, for example, and that it further defines over the applied art.

REQUEST FOR INTERVIEW

If the Examiner has any questions with regard to this application, he/she is respectfully requested to contact the undersigned so that an interview can be arranged in connection with this application.

CONCLUSION

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone or in combination.

Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but to merely show the state of the art, no comment need be made with respect thereto.

In view of the above amendments and remarks, reconsideration of the rejections and allowance of all of the claims are respectfully requested.

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

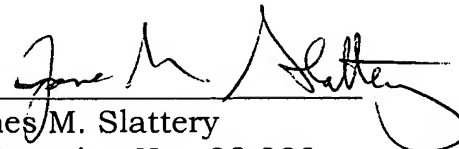
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (703) 205-8000 in the Washington, D.C. area.

A prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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